

BABAYAN, E.A., otv.red. (Moskva); FEDOTOV, D.D., red.; ZENEVICH, G.V.,
red. (Leningrad); LEBEDEVSKIY, M.S., red. (Moskva); MYASISHCHEV,
V.N., red. (Leningrad); RAPOORT, ~~Red.~~, red. (Moskva);
SUKHAREVSKIY, L.M., red. (Moskva)

[Problems in occupational therapy] Voprosy trudovoi terapii.
Moskva, M-vo zdravookhraneniia SSSR, 1958. 299 p.

(MIRA 14:4)

(OCCUPATIONAL THERAPY)

Rapoport, A.M.

Dynamics of schizophrenia in the U.S.S.R. and in foreign countries.
Vop. psikh. no. 3:17-33 '59. (MIRA 13:10)
(SCHIZOPHRENIA)

Rapoport, A.M., kand.med.nauk

Lead a more active struggle against alcoholism. Ochr.truda
i sots.strakh. no.3:79-80 Mr '59. (MIRA 12:4)
(Alcoholism)

Rapoport, A.M.

"Transcultural study on the problems of mental health." Zhur.nevr.i psikh.
59 no.11:1401-1405 '59. (MIRA 13:3)
(MENTAL HYGIENE)

Rapoport, A.M.

Nomenclature for mental diseases in the U.S.S.R. Vop. psikh. no.4:
7-19 '60. (MIHA 15:2)

(PSYCHIATRY_NOMENCLATURE)

RAPOPORT, A.M. (Moskva)

So-called compulsory treatment of alcoholics. Probl.sud.psikh.
9:388-395 '61. (MIRA 15:2)

(ALCOHOLISM-TREATMENT)

RAPOPORT, A.M.

"The organization of psychiatric care and psychiatric research in the Union of Soviet Socialist Republic" by N.S. Kline. Reviewed by A.M. Rapoport. Zhur. nevr. i psikh. 62 no.3:453-460 '62. (MIRA 15:3)

(PSYCHIATRIC RESEARCH) (PSYCHIATRIC HOSPITALS)
(MENTALLY ILL-CARE AND TREATMENT)
(KLINE, N.S.)

RAPOPORT, A.M. (Moskva)

Problems of diagnosis and expertises on alcoholic intoxication in the U.S.S.R. and foreign countries. Trudy Gos. nauch. issl. inst. psikh. 38:390-399 '63 (MIRA 16:11)

F. H. C. P. 1. 74

AUTHOR: Rapoport, A. M.

90-58-4-4/6

TITLE: Experience With the Operation of Motors of the Types 8S230R in Installations of the Oil Industry (Opyt ekspluatatsii dvigateley 8S230R na predpriyatiyakh neftyanoy promyshlennosti)

PERIODICAL: Energeticheskiy Byulleten', 1958, Nr 4, pp 28-32 (USSR)

ABSTRACT: In the oil industry of the USSR, motors of the type 8S230R made by the firm Skoda (Shkoda) in Czechoslovakia are used as drives for mud pumps at drilling operations and for generators in small electric power stations. The mud pumps driven by the motors are of the type U8-3, the generators of the a-s type of 275 kva. The drilling was made by the turbine method. The output of two mud pumps driven by the motors amounted to 45-50 l/sec. Diesel fuel type GOST 4749-49 and diesel oil Dpl1, Dpl4, and MT-16P were used. Operation time between overhauling ranges between 8,000 - 9,000 hours at electric stations, and 3,000 - 6,000 hours at drilling operations. In the table, the operation characteristics of the motors 8S230R are compared with those of the motors V2-300. The motors V2-300 were replaced by the type 8S230R and the work of the electric power stations improved accordingly. The assets of the type 8S230R are:

Card 1/2

90-58-4-4/6

Experience With the Operation of Motors of the Type SS230R in Installations of
the Oil Industry

reliable parallel work of 2 and more motors; easy connection with the parallel work of an electric generator; higher efficiency factor of the station; possibility of long continuous work; work with low noise level. The drawbacks of these motors are: breakdown of oil filter casings caused by longitudinal cracks; breaking of the valve springs and of the fuel pump plunger; premature wear of stuffing box packings; fast wear of the driving pulley bushings (made from lead bronze); sudden drop of the oil pressure, etc.

There is 1 table and 2 Soviet references.

AVAILABLE: Library of Congress

Card 2/2 1. Petroleum 2. Electrical motors-Performance

OSADCHUK, Ye.I.; RAPORT, A.N.

Increasing the efficiency in the use of drilling equipment;
a topic for discussion. Neft. khoz. 41 no.6:8-12 Je '63.
(MIRA 17:0)

RAPOPORT, A.N.

Use of 8S23R engines in the petroleum industry. Energ. biul.
no.4:28-31 Ap '58. (MIRA 11:5)

(Gas and oil engines)
(Oil fields--Equipment and supplies)

GINZBURG, D.B., doktor tekhn. nauk; RAPOPORT, A.Ya., inzh.

Improving the design of furnaces with necks. Stek. i ker.
20 no.8:1-7 Ag '63. (MIRA 16:11)

1. Moskovskiy khimiko-tehnologicheskiy institut imeni
D.I. Mendeleyeva (for Ginzburg).

GINSBURG, I.B., doktor tekhn. nauk (deceased); RABORCHIK, A.Ya., inzh.;
SLIVINSKIY, I.S., inzh.; TURKEV, L.P., inzh.; ZIL'KIN, G.B., inzh.

Investigating processes of manufacturing high-leat glass.
Stek. i ker. 22 no.12+9.11 P '65. (MIRA 12.12)

RAPPORT, A.Ye.,

Epidemiologic significance of convalescents from dysentery.
Zhur.mikrobiol. epid. i immun. no.10:49-51 O '55 (MLRA 8:12)
(DYSENTERY, BACILLARY,
convalescence)

BC

Reduction **and** **Hyperthyroidism** **using** **alpha**
agonists **under** **local** **anaesthesia**

11

ASM-SEA METALLURGICAL LITERATURE CLASSIFICATION

卷之三

APPROVED FOR RELEASE: Tuesday, August 01, 2000 CIA-RDP86-00513R0013442

LOSEV, A., mayor; RAPOPORT, B., kapitan.

Wind determination from radio direction stations. Vest.Vozd.Fl.
34 no.10:47-51 O '51. (MIRA 8:3)
(Navigation (Aeronautics)) (Radic direction finders)

Reduction and hydrogenation over alloy catalysts at elevated hydrogen pressures. II. L. B. Rapoport and B. Rapoport. *J. Applied Chem.* (U.S.S.R.) 11, 722-30 (in French) (1958); *ibid.* 12, 1689. The conditions of reduction at elevated pressure of some ketones and aldehydes and those of hydrogenation of pyridine bases were investigated. In all expts. 75 kg. of the substance and 10 g. of the Ni-Co-Al catalyst were introduced into an autoclave provided with an elec. heater, and the expts. were carried out at a const. (100 atm.) H₂ pressure. At this pressure the reduction and hydrogenation processes proceeded with the greatest velocity. The expts. were terminated as soon as the absorption of the H₂ ceased. After cooling, the residual pressure was measured by the manometer and the reaction mixture was fractionated. The

Ni-Co-Al catalyst contg. A little of Co, was treated with 20.6% alkali, washed with water and kept under water undissolved. The exptl. results were as follows: (a) MeC₆H₅CO treated at 125-130° for 260 min. (absorbed 32 atm. of H₂) yielded only MeC₆H₅OH and 7.2% of unchanged MeC₆H₅CO; (b) MeC₆H₅CO treated at 200° for 220 min. (absorbed 12 atm. of H₂) yielded only MeC₆H₅OH and 1.4% of unchanged ketone; (c) PhCO (50 g.) treated at 150° for 140 min. (absorbed 12 atm. of H₂) yielded only PhCH₂, and 6.25% of unchanged ketone; (d) BrCH₂ treated at 150-160° for 110 min. (absorbed 10 atm. of H₂) yielded PhMe and PhCH₂OH; (e) MeCHO (not pure) treated at 150° for 180 min., yielded PhOH; (f) furfural treated at 150-160° for 210 min. (used 12 atm. of H₂) yielded furfural and 0.01% of unchanged furfural; (g) PhNH₂ treated at 210° for 230 min. (used 10 atm. of H₂) yielded PhNH₃. The decomps. of PhNH₂ to C₆H₆ and NH₃ was also observed but the yield of these products was very small. Under the same conditions but using the Ni-Al catalyst the yield of PhNH₃ (av. 73%) was smaller than that obtained using the Ni-Co-Al catalyst; the a pyridine fraction contg. of picoline ($d_4^{25} 0.9687$) and 4-(3,5-dicarboxyphenyl)-4-picolinone and some unchanged substance. [Given ref. cited.] V. A. Postovskiy

Rapoport, B.D., inzhener.

Changing the design of reversible clutches of a DKA-0.25 excavator. Mekh.stroi
10 no.11:30 N '53. (MLR 6:11)
(Excavating machinery)

RAPPORT, B.E., mayor.

Diagram facilitating the navigator's work in breaking through
clouds. Vest.Vozd.Fl. 39 no.8:38-41 Ag '56. (MLRA 10:1)
(Navigation (Aeronautics))

Rapoport, B.E., mayor.

Diagram facilitating the navigator's work in breaking through clouds.
Vest.Vozd.Fl. 39 no.8:41-44 Ag '56. (MLRA 10:1)
(Airplanes--Landing) (Radio direction finders)

AID P - 4751

Subject : USSR/Aeronautics - landing approach

Card 1/1 Pub. 135 - 9/31

Author : Rapoport, B. E., Maj.

Title : A graph which facilitates the navigator's work during
the descent through overcast.

Periodical : Vest. vozd. flota, 8, 38-41, Ag 1956

Abstract : This is the third in the series of 4 articles which
appear in this issue under the title "Landing Approach
under Adverse Weather Conditions". The author suggests
a graph which expedites the navigator's work during the
descent through overcast for a landing approach. Two
graphs, 1 table.

Institution : None

Submitted : No date

RAROFUNT, E.I.

29325 Nervnyye sindromy pri rake. (Opyt klassifikatsii.) Voprosy onkologii i rentgenologii, No. 1-2, 1979; S. 35-41

SO: Letopsi' Zhurnal'nykh Statey, Vol. 39, Moskov, 1949

RAPOFURK, B.I.

29324 K patogenezu nervnykh sindromov pri zloka-chestvennykh opukholyakh.
(Otdel'nyye nablyudeniya.) Voprosy onkologii i rentgenologii, No. 1-2, 1948
S. 42-46

SO: Letopsi' Zhurnal'nykh Statey, Vol. 39, Moskov, 1949

RAPORT, N. Y.

22357. Ostat rentgenoskopij ot sluzhbyj radiodispozicij vremja tsvetnyj. Vsego sluzhbyj radiodispozicij i rentgenoskopij, so 1-3, 1948, s. 317-318.

SO: Letopis' zhurnal'nykh stater. Vol. 30. Moskva, 1959.

RAI OPCRT, B. I.

Rentgenoterapiya travmatischeskikh zabolеваний perifericheskoy nervnoy sistemy. Voprosy onkologii i rentgenologii, No 1-2, 1948, s. 324-27

SO: Izvestiya Ak. Nauk Latviyskoy SSr. No. 9, Sept. 1955

RAPOPORT, B.I.; ROZENFLYAND, Ye.A.

Roentgenotherapy of acute poliomyelitis. Pediatrilia, Moskva No.1:71
(CLML 21:4)
Jan-Feb 52.

1. Of the Central Psychoneurological and Neurosurgical Hospital of
the Ministry of Ways of Transportation and of the Ukraine Roentgen-
Radiological and Oncological Institute.

RAPPORt, R. I.; LEKHTSIER, L. I.; SUSHINA, N. S.

Tongue - Diseases

X-ray therapy of glossdynia. Stomatologija No. 3, 1952

Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.

P
IL'YEVICH, A.I.; KANTOROVICH, M.A.; KRASTINA, E.M.; RAPOPORT, B.I.

Analgesia in cancer. Vop. onk. 2 no.1:66-71 '56 (MIRA 9:4)

1. Iz Ukrainskogo rentgeno-radiologicheskogo i onkologicheskogo
instituta (dir.-dotsent Ye.A. Bazlov)

(NEOPLASMS

 pain in incurable cases, analgesia)

(ANALGESIA

 in incurable cancer)

Rapoport, B.I. i Netheba, M.M.

Roentgenotherapy of diseases of sympathetic ganglia (ganglionitis).
Zhur.nevr. i psikh. 56 no.4:330-332 '56. (MLBA 9:7)

1. Tsentral'naya psichoneurologicheskaya i neirokhirurgicheskaya
bol'ница (nach. V.M.Yushin) Ministerstva putey soobshcheniya SSSR
i Ukrainskogo rentgeno-radiologicheskogo i onkologicheskogo instituta
(dir. dotsent Ye.A.Bazov)

(GANGLIA, AUTONOMIC, diseases,
ganglionitis, x-ray ther. (Rus))
(RADIOTHERAPY, in various diseases,
ganglionitis, sympathetic (Rus))

RAPOPORT, B.I.

Electrically driven continuous action suspended roadway for
conveying cans between carding and lapping machines. Obm.tekh.
opyt. [MLP] no.16:25-29 '56. (MIRA 11:11)
(Conveying machinery--Electric driving) (Carding)

RAPOPORT, B.I.

Radiation injuries of the central nervous system following
roentgenotherapy for malignant tumors; review of foreign literature.
Med.rad. 3 no.1:77-85 Ja-J '58. (MIRA 11:4)
(CENTRAL NERVOUS SYSTEM, effect of radiations,
x-ray inj. in ther. of cancer, review (Rus)
(RADIOTHERAPY, complications,
C_NS inj. in cancer ther., review (Rus)
(NEOPLASMS, therapy,
x-ray, causing C_NS inj., review (Rus)

Rapoport, B.I.; Glazko, N.A.

Roentgenotherapy in polyneuritis. Vest. rent. i rad. 32 no.1:5-6
supplement '57 (MIRA 10:5)

1. Iz TSentral'noy klinicheskoy psichoneurologicheskoy i
neyrokhirurgicheskoy bol'nitsy Ministerstva putey soobshcheniya
Ukrainskogo rentgeno-radiologicheskogo i onkologicheskogo instituta.
(POLYNEURITIS, ther.
radiother.)
(RADIOTHERAPY, in various dis.
polyneuritis)

RAPOPORT, B.M.

DECEASED
C 1962

I962/5

SEE IIC

CHEMISTRY

Rapoport, B.N.; Russnik, S.I.; Batunin, M.P.; Matusis, I.I.; Glavinskai, T.A.;
Pesina, Z.A.; Bolshakova, V.F.; Fedorovskaya, R.F.

"Results of the use of monoethyl ester of ethylene glycol (cellosolve)
in the treatment of 266 cases of various types of dermatosis."

Nauch. Zap. Gorki, Inst. Derm. 1955, 16, 11 -- 24; Referat. Zh. Biol. Khim, 1956,
Abstr. No. 88417.

For Abstract see Matusis, I.I.

"the influence of hydrocolloid dressings on the utilization of citric acid at a focus of inflammation."

Zoetnik berorologii i formacii (Atlas of General Pathology),
no. 1, Jan. 31, 1959 (edgar), Moscow.

Rapoport, B.N.

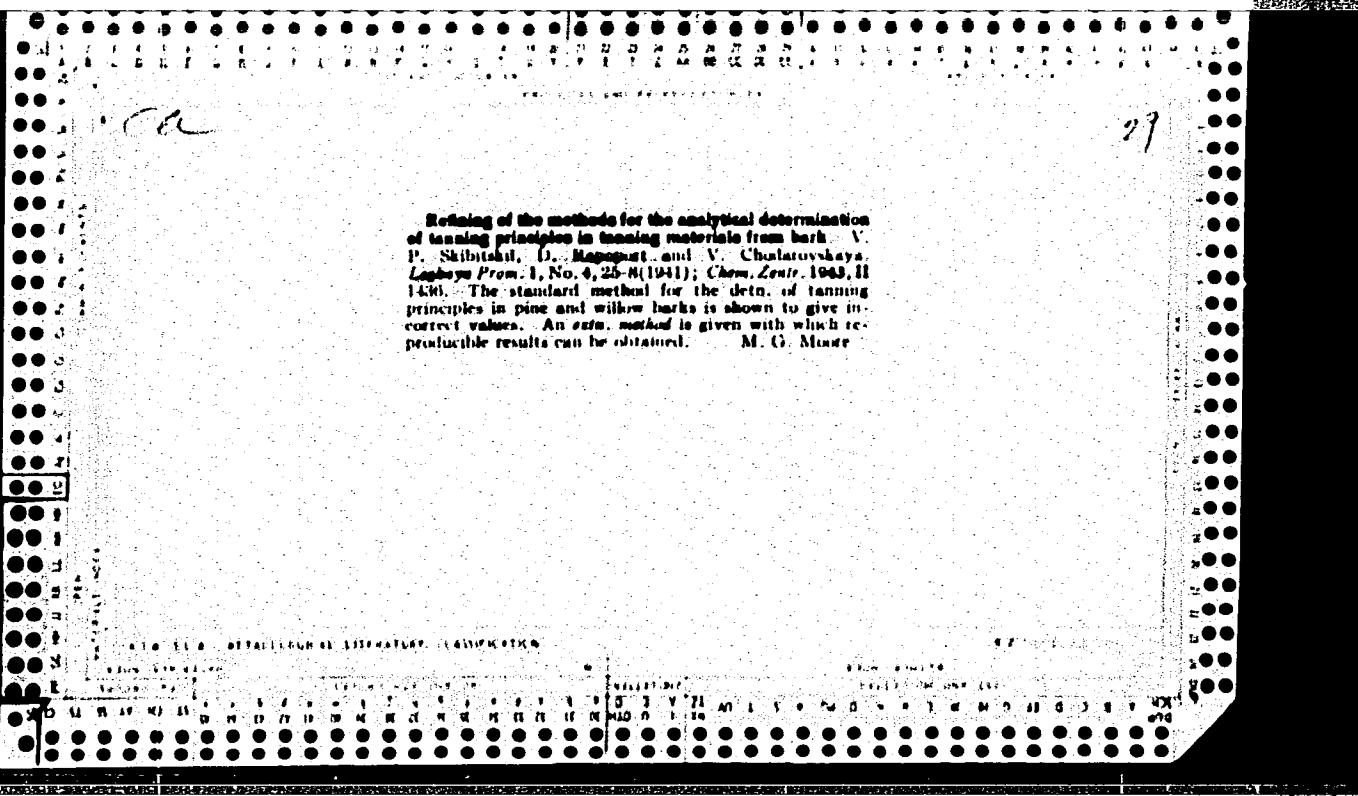
BATUNIN, M.P.; MATUSIS, I.I.; GLAVINSKAYA, T.A.; PESINA, Z.A.; BOL'SHAKOVA, V.F.
FEDOROVSKAYA, E.F.; RAPOPORT, B.N.; RUSSOWIK, S.I.

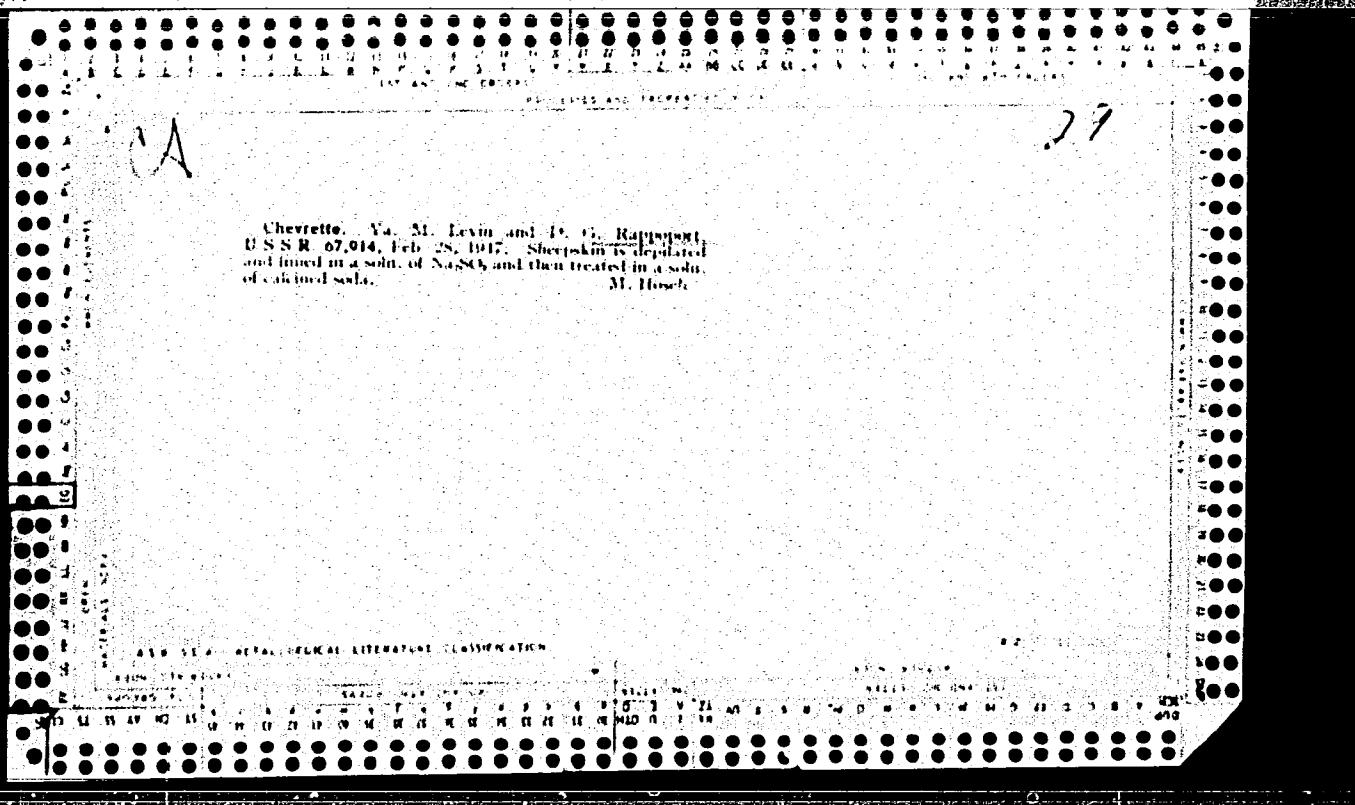
Use of ethyleneglycol monoethyl ether in dermatology. Vest. ven.
1 derm. no.3:11-15 My-Je '54. (MLRA 7:8)

1. Iz Gor'kovskogo kozhno-venerologicheskogo instituta (dir. prof.
M.P.Batunin)

(SKIN diseases,
*ther., 2-ethoxyethanol)

(ALCOHOL, ETHYL derivatives,
*2-ethoxyethanol, ther. of skin dis.)





LEUS, E.Ye.; RAPOPORT, D.I.: PAREPLOCHIKOVA, V.S.

Gamma globulin seroprophylaxis in Botkin's disease. Zdrav.
bol. 9 no.1:37-38 J'63. (MIKA 16:8)

1. Iz Comel'skoy gorodskoy sanitarno-epidemiologicheskoy
stanitsii (glavnnyy vrach V. Prokhas'ko).
(HEPATITIS, INFECTIOUS) (GAMMA GLOBULIN)

RAPPOROT, D.M.; SEDOVA, L.I.; MERTEKHIN, I.I.

Apparatus for determining the fuel consumption and the number of crankshaft revolutions. Trakt. i sel'khozmash. 31 no.1:18-20 Ja '61. (MIRA 14:1)

1. Nauchno-issledovatel'skiy avtotraktornyj institut.
(Tractors—Engines—Testing)

RAPPOORT, D.M., dotsent; CHUKAVINA, A.I., assistant

Effect of Novo-Izhevsk mineral water on the gastrointestinal tract.
Trudy Izhev.gos.med.inst. 13:397-401 '51. (MIRA 13:2)

1. Iz kafedry fakul'tetskoy terapii Izhevskogo meditsinskogo instituta.
(NOVO-IZHEVSK (UDMURT A.S.S.R.)--MINERAL WATERS)

5(1,2)

AUTHOR:

Rapoport, D. M.

SOV/153-58-6-21/22

TITLE:

The Kinetics of Drying of Balls of an Alumosilicate Catalyst
(Kinetika suszki shariakov aliumosilitkogo katalizatora)

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i
khimicheskaya tekhnologiya. 1958. Nr 6, pp 121-127 (USSR)

ABSTRACT:

The drying mentioned in the title leads to a waste of the catalyst. The present paper deals with several factors which take part in the process like the soaking with solutions of surface-active substances as well as the humidity of the air blown through, and the temperature, as far as they influence the mentioned kinetics. The change of resistance to crushing during the drying process of the ball was investigated as well. Figure 1 shows the laboratory which served for the above mentioned purpose. The balls were soaked with neutralized acid petroleum asphalt (Ref 1) as well as with sulfo acid-ammonium salts and agar-agar solutions before they were dried at 97°, 115°, and 140°. The drying process was carried out with and without blowing through of air. Figure 2 shows the results. Figure 3 shows the experimental results concerning the effect of an absolutely dry air at

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SCV/53,58.1-21/22

The Kinetics of Drying of Balls of an
Alumosilicate Catalyst

different temperatures. This shows that the surface-active substances do not influence the velocity of drying with absolutely dry air. Figure 4 shows that a dependence exists between the drying velocity (duration) and the temperature which is expressed by a straight line. Figure 5 gives the investigation results of the effect of the air blown through. Figure 6 shows that the shrinkage of the balls does not depend on the method of soaking (in line with an equation of Ref 2). Figure 7 demonstrates the experimental results of the resistance of the ball to crushing in dependence on the humidity content. This resistance increases with advancing drying, independently of the soaking liquid. This holds in the case of a content up to 4 kg/kg. In the case of a further removal of humidity the strength of the balls soaked with surface-active substances rises more quickly than that of balls soaked with water. In the case of completely dried balls the strength is in the first case 50% higher than in the latter. The author tries to explain these phenomena. Not the chemical nature of a surface-active substance, but its surface-activity acts upon the drying kinetics. Since the author used on the

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The Kinetics of Drying of Balls of an
Alumosilicate Catalyst

SOV/153-58-6-21/22

whole colloidal surface-active substances which are to an
only small extent water-soluble, but highly active, their
effect was not the same, independently of their chemical
nature. There are 7 figures and 4 Soviet references.

ASSOCIATION: Kafedra fizicheskoy i analiticheskoy khimii, Ufimskiy
neftyanoy institut (Chair of Physical and Analytical
Chemistry, Ufa Petroleum Institute)

SUBMITTED: November 29, 1957

Card 3/3

ACCESSION NR: AP4012733

8/0218/64/029/001/0071/0079

AUTHOR: Rapoport, E. A.

TITLE: Characteristics of histone metabolic activity in resting and dividing liver cells

SOURCE: Biokhimiya, v. 29, no. 1, 1964, 71-79

TOPIC TAGS: histone, histone metabolic activity, lysine histone, arginine histone, resting liver cell, dividing liver cell, lysine specific activity, arginine specific activity, Cl^{14} -methionine, Cl^{14} -lysine, Cl^{14} -glycine, amino acid activity, hepatoma

ABSTRACT: Labeled precursors Cl^{14} -methionine, Cl^{14} -lysine, and Cl^{14} -glycine were used to investigate metabolic activities of lysine and arginine histones in normal, regenerating, and embryonic livers of male rats, in livers of pregnant female rats, and in rat hepatomas. Rats were killed 2 hrs after the labeled amino acids were introduced. Cell nuclei of all tissues were isolated by Schneider's method, cell proteins were fractionated by Ernst and Hagen's method, and histones were separated into arginine and lysine by Daly and Mirsky's method.

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ACCESSION NR: AP4012733

All proteins were extracted by Schneider's method, and after drying, radioactivity was measured with an end counter. In normal livers the specific activity of lysine is higher than that of arginine. After the introduction of the various amino acids, the specific activity ratio values for both histones remain practically the same. With the presence of C¹⁴-lysine, lysine specific activity is higher than that of arginine in regenerating and embryonic livers and in hepatoma. With C¹⁴-methionine the specific activities of these two histones do not differ. With the presence of C¹⁴-lysine and C¹⁴-methionine, the specific activity of lysine is higher than arginine activity in livers of pregnant females. Differences in specific activity ratio values for these two histones are related to differences in utilization of C¹⁴-methionine and C¹⁴-lysine in lysine biosynthesis. A relative decrease in C¹⁴-methionine utilization takes place in hepatomas and embryonic livers during lysine and arginine biosynthesis, and a relative increase in C¹⁴-lysine activity takes place in livers of pregnant animals. Amino acid activity is the same for each of the histones in resting cells. Amino acid activity in dividing cells differs from that of resting cells possibly because of different interactions of these proteins with the other chromatin components

Card 2/3

ACCESSION NR: AP4012733

depending on the functional state of the cell nucleus. Orig. art.
has: 5 tables.

ASSOCIATION: Laboratoriya biokhimii instituta khirurgii im. A. V.
Vishnevskogo, Akademii meditsinskikh nauk SSSR, Moscow (Biochemistry
Laboratory, Institute of Surgery, Academy of Medical
Sciences SSSR)

SUBMITTED: 19Apr63

SUB CODE: AM

DATE ACQ: 03Mar64

NO REF Sov: 005

ENCL: 00

OTHER: 022

Card 3/3

RAPCPGRT, E.A.

Characteristics of the metabolic activity of histones in
resting and dividing liver cells. Biokhimia 29 no. 1:
71-79 Ja-F '64.

(MIRA 18:12)

1. Laboratoriya biokhimii Instituta khirurgii imeni
A.V. Vishnevskogo AMN SSSR, Moskva. Submitted April 19, 1963.

"APPROVED FOR RELEASE: Tuesday, August 01, 2000 CIA-RDP86-00513R001344

...samples of tissue, primarily from the brain and spinal cord.

Spec. No. 98-K-163 no. 450127-A-1.

Submitted Pittsburgh by A.V. Mammen, M.D., dated October 20, 1944.

APPROVED FOR RELEASE: Tuesday, August 01, 2000 CIA-RDP86-00513R0013442

"APPROVED FOR RELEASE: Tuesday, August 01, 2000 CIA-RDP86-00513R001344

APPROVED FOR RELEASE: Tuesday, August 01, 2000 CIA-RDP86-00513R0013442

POGOSOVA, A.V.; RAPOPORT, E.A.; ZELENINA, V.P.

Synthesis of organic proteins in the presence of an active growth
focus in the organism. Dokl. AN SSSR 154 no.5:1206-1209 F'64.
(MIRA 17:2)

1. Institut khirurgii im. A.V. Vishnevskogo AMN SSSR, Predstavлено
академиком А.Н. Бакулем.

BABSKAYA, Yu.Ye.; KOMIKOVA, A.S.; KRITSMAN, M.G.; POGOSOVA, A.V.;
RAPOPORT, E.A.

Problems of the synthesis of specific proteins. Dokl. AN SSSR
146 no.2:460-463 S '62. (MIRA 15:9)

1. Institut khirurgii im. A.V. Vishnevskogo AMN SSSR i Institut
terapii AMN SSSR. Predstavлено академиком V.N. Chernigovskim.
(PROTEINS)

RAPORT, L. I. (1974). Biological activity and metabolism of histidines. Usp. Sovr. Biol. 59, no. 1: 51-70. Ja-F '65. (MIRA 18:2)

Rapoport, E.M., dots.; KOVALEV, Ye.S., dots., red.

[Azimuth determination in railroad surveying] Azimutal'-nye opredeleniya pri izyskaniakh zheleznykh dorog; uchebnoe posobie. n.p. Dnepropetrovskii in-t inzhenerov zhel-dor. transporta. Pt.1. 1961. 53 p. (MIRA 16:4)
(Railroads—Surveying)

MOLEVA, N.G.; KUSAKIN, P.S.; RAPORT, E.M.

Interaction of oxides and sulfides through the gaseous phase.
Izv. Sib. otd. AN SSSR no.2:57-61 '58. (MIRA 11:9)
(Metallurgy)

SOV/137-58-10-20467

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10, p 18 (USSR)

AUTHORS: Moleva, N.G., Kusakin, P.S., Rapoport, E.M.

TITLE: Gas-phase Reaction of Oxides and Sulfides (O vzaimodeystvii
okislov i sul'fidov cherez gazovuyu fazu)

PERIODICAL: Izv. Sibirsk. otd. AN SSSR, 1958, Nr 2, pp 57-61

ABSTRACT: An investigation is made of Cu, Ni, and Fe oxides and sulfides. The experimental conditions excluded the occurrence of solid-phase reactions. The possibility was established that these compounds could react in the gas phase. The low value of the dissociation equilibrium pressures does not interfere with the course of the reactions. The process is limited by the diffusion of O₂ and S₂ through the film of metal and sulfide formed. The reaction resolves itself to the reduction of oxides to metal by gaseous sulfur and subsequent sulfidization of the latter.

1. Copper oxide--Phase studies 2. Nickel oxide--Phase G. F.
studies 3. Iron oxide--Phase studies

Card 1/1

PROCESSED AND SECURED BY:

Alterations in fat contents of salted fish in storage
E. P. Rapaport-Roitman and V. R. Ozerski. *Voprosy
Priborostroyeniya*, No. 2, 95-101 (in English 101) (1948).—The
fat of salted fish stored at 18-20° showed a gradual in-
crease in acid and sapon. nos. The fat becomes rancid
when the acid no. reaches 21-22. An increase in the
sapon. no. by 30-40% indicates considerable decompo-
sition of the fat.

S. A. Karapala

ASH-114 METALLURGICAL LITERATURE CLASSIFICATION

GETSELEV, Z.N., inzh.; RAPORT, E.Ya., inzh.

Automatic control of thermal conditions in gas-fired
reverberatory furnaces. Mekh. i avtom.proizv. 16 no.1:29-31
Ja '62. (MIRA 15:1)

(Metallurgical furnaces)
(Thermostat)

BIRYUKOV, V.A.; KIM, I.I.; RAPORT, E.Z.

Principles of construction of the V-2 apparatus for multiplexing
rural communication lines. Elektrosviaz' 19 no.4:38-47 Ap '65.
(MIRA 18:6)

RAPOPORT, F. M.

PA 160T13

USSR/Chemistry - Gases, Analysis of
Sulfur Compounds, May 50

Determination

"Separate Determination of Organic Compounds of
Sulfur in Gases," F. M. Rapoport, State Inst. of
Nitrogen Ind., 6 pp

"Zavod Lab" Vol XVI, No 5

Develops method for quantitative determination of
carbon bisulfide, thiophene, and carbon oxyulfide
in gases based on their selective absorption. Es-
tablishes proper concentrations of sulfuric acid
for absorption of thiophene and solvent for ab-
sorption of carbon bisulfide. Method, checked by
160T13

USSR/Chemistry - Gases, Analysis of
(Contd) May 50

application to prepared gas mixture, showed accu-
racy $\pm 7\%$ for determination of carbon bisulfide and
carbon oxyulfide and 10% for thiophene.

160T13

RAPORT, F.M.

12053. DETERMINATION OF SMALL AMOUNTS OF ORGANIC SULPHUR IN GASES.
Il'inskaya, A.A., Kontorovich, L.M. and Raport, F.M. (Trud. Gos. nauch.-issled. Proekt. Inst. Akot. Prom. (Prots. Inst. Nitrogen Ind., U.S.S.R.), 1952 (Publ. 1953), (11), 269-274; abstr. in Ref. Zh. Khim. (Ref. J. Chem., Moscow), 1956, (23), 7571). The volumetric method described is based on oxidation of oxygen compounds at $750 \pm 25^\circ\text{C}$, at which temperature nitrogen oxides are not formed. Sulphur dioxide is absorbed with a 3% neutral solution of hydrogen peroxide and SO_4^{2-} is determined by titration with a 0.01 N solution of alkali and methyl red. With a sulphur content of 10-30 mg/cu.m the error is 10-15%. Results are in good agreement with the lamp method. For sulphur concentrations of about 100 mg/cu.m, the analysis takes 30-40 min (gas passing at 300 l./h). For concentrations below 10 mg/cu.m the analysis takes longer. The method has been used for the analysis of nitrogen-hydrogen mixtures.

Rapoport, F.M.

✓ 2054. SEPARATE DETERMINATION OF ORGANIC SULPHUR COMPOUNDS IN GASES.
Rapoport, F.M. (Trud. Gos. nauch.-issled. proekt. Inst. Azot. Prom. (Proc. Inst. Nitrogen Ind., U.S.S.R.), 1952 (Publ. 1953), (1), 275-85; abstr. in Ref. Zh. Khim. (Ref. J. Chem., Moscow), 1956, (23), 75376). Carbon disulphide, carbonyl sulphide, thiophenes and mercaptans are determined by selective adsorption with 98 and 93 or less % sulphuric acid and spindle oil. The method has been used on coke oven gas.

3

PM-306

BLAZHENNOVA, A.N.; IL'INSKAYA, A.A.; PAPOORT, F.M.; FAYNBERG, M.M.,
redaktor [deceased]; FILIPPOVA, N.A., redaktor; LUR'YE, M.S.,
tekhnicheskly redaktor

[The analysis of gases in the chemical industry] Analiz gazov v
khimicheskoi promyshlennosti. Pod red. M.M.Fainberga. Moskva,
Gos. nauchno-tekhn. izd-vo khimicheskoi lit-ry, 1954. 327 p.
(Gases--Analysis) (MIRA 8:?)

HAFONORT, F.M.; HAN TINA, N.E.; YANG, Y., S.N.

Determination of potassium in complex and mixed phosphorus fertilizers. Zav. Rev. 30 no. 1 (1959) 1-10 (M.R.D. 198)

RAPOPORT, Frida Moiseyevna; IL'INSKAYA, Aleksandra Arkad'yevna;
ODERBERG, L.N., red.; KOGAN, V.V., tekhn. red.

[Laboratory methods for obtaining pure gases] Laboratornye
metody polucheniia chistykh gazov. Moskva, Goskhimizdat,
1963. 419 p.

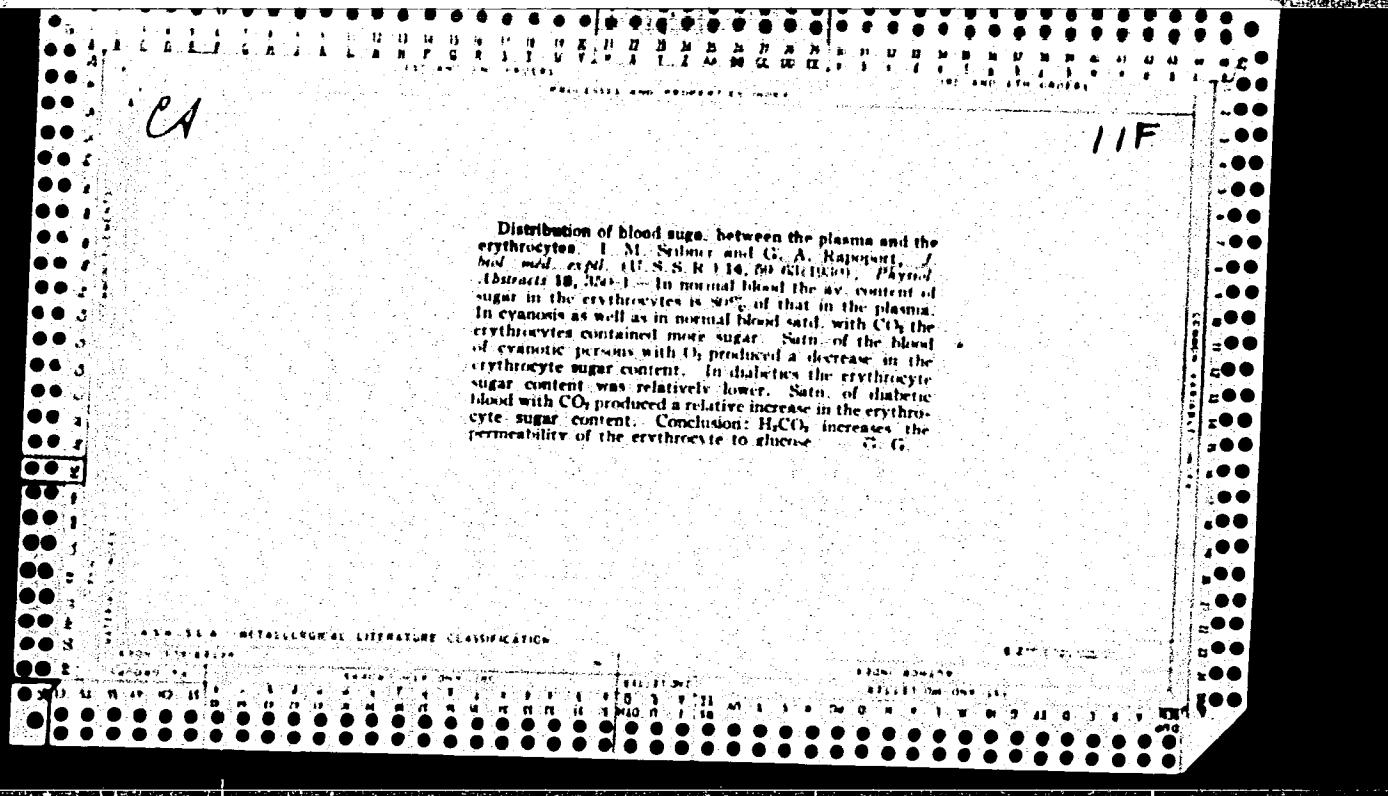
(Gases)

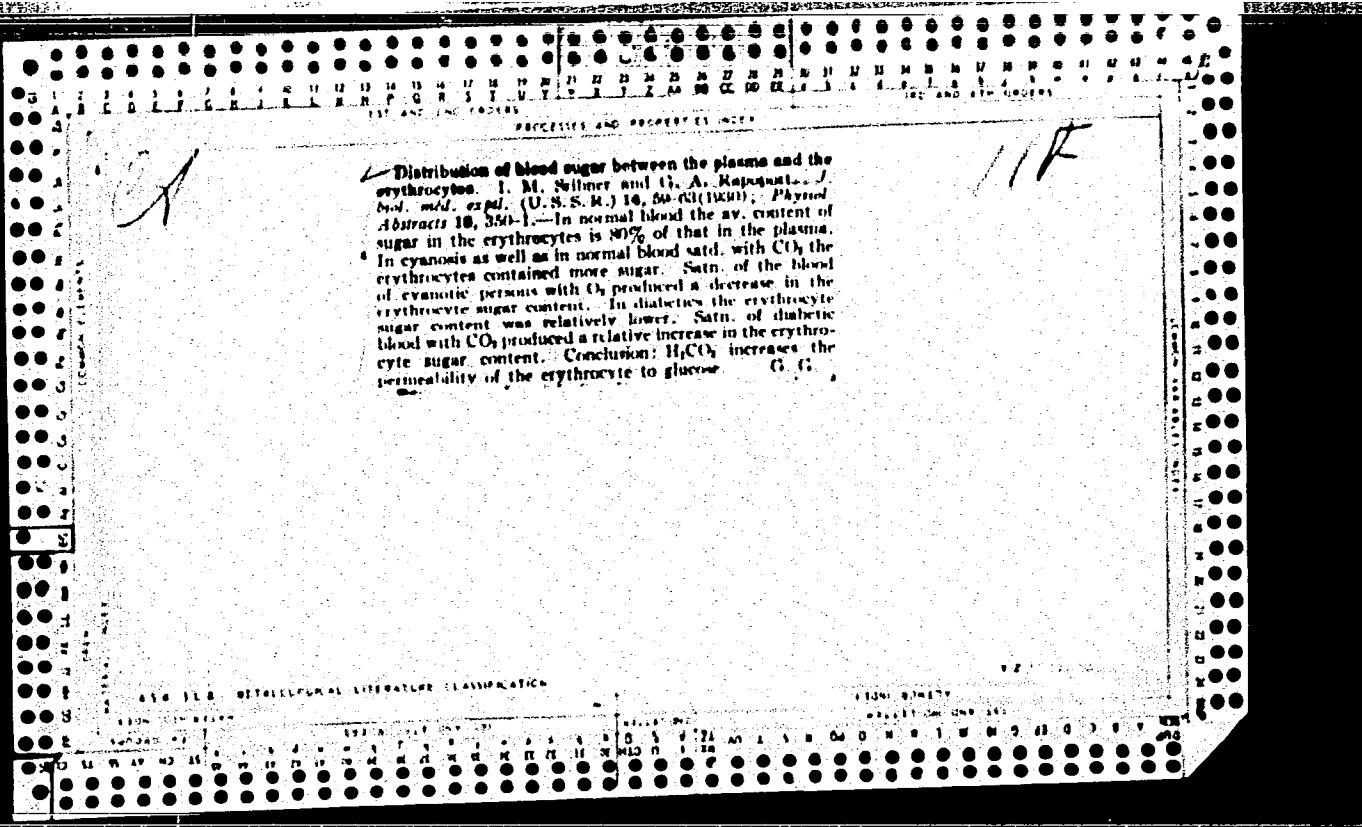
RAPOPORT, G.

On behalf of woodpulp. Bum.prom. 36 no.1:4 Ja '61. (MIRA 14:3)

1. Ispolnyayushchiy obyazannosti direktora Kamskogo tsellyuloznobumazhnogo kombinata.

(Woodpulp)





PALYANITSA, V.N. (Kolomyya, Stanislavskoy obl., ul. Khmel'nitskogo, d.22);
RAPOPORT, G.L.

Thrombosis of the bifurcation of the aorta. Nov.khr.arkh. no.5:
108-110 S-O '59. (MIRA 13:3)

1. Khirurgicheskoye otdeleniye (zaveduyushchiy - V.N. Palyanitsa) i
prozektura Kolomyyskoy gorodskoy bol'nitsy, Stanislavskoy oblasti.
(AORTA--DISEASES) (THROMBOSIS)

GRIN, I. V. (Kolomyya, ul. Zhdanova, d. 23); RAPORT, G. L.

A case of fibroleiomyoma of the fundus of the stomach. Nov. khir. arkh.
5:114-115 S-O '58. (MIRA 12:1)

1. Rentgenologicheskiy kabinet i patologistologicheskaya laboratoriya
Kolomyyskoy gorodskoy bol'niy, Stanislavskoy oblasti.
(STOMACH--TUMORS)

Rapoport

Tetel'baum, S. I., and Rapoport, G. N., "An Approach to the Problem of the Application of the Analysis Method by Powers of a Small Parameter for Study of Self-Oscillating Systems With a Delay Element", Sbornik nauchno-tekhnicheskikh statey (Collected Scientific-Technical Articles), No. 2, Kiev, AN UkrSSR, 1948, pp. 93-98, one illustration, bibliography, 11 titles.

S. L. H.

Rapoport, G. N.

Verbatim: Rapoport, G. N. - "On the problem of the movement of an electronic current within a closed metal casing," Sbornik nauch.-tekhn. Statey (Akad. nauk Ukr. SSR, Inst. elekrotekhniki), Issue 2, 1948, p. 110-13, - Bibliog; 7 items

SO: U-4355, 14 August 53, (Letccis 'Zhurnal 'nykh Statey, No. 15, 1949.)

RAPORT, i ...

37312. Op ustrojivosti rezhikov sinchronykh kolebaniy slaco svyazannykh
avtogeneneratorov s ravninov moshchnosti. Sbornik nauch-tekhn statey (akad.
nauk Ukr. SSR, in-t elektrotehniki), vyp. 1, 1949, s. 11-31-S. illoj: 12.
12 strav.

SO: Letopis' Zhurnal'nykh Statey, Vol. 7, 1949

1. RAYCHORT, G...
2. USSR (600)
4. Wave Guides
7. Computation of a symmetric diaphragm in a round wave guide. Zhur.tekh.fiz. 22 no.6, 1952.

9. Monthly List of Russian Accessions, Library of Congress, January 1953. Unclassified.

Rapoport, G.N.

USSR/Electronics - Waveguide

Jun 52

"Design of a Symmetrical Diaphragm in a Circular
Waveguide," G. N. Rapoport, Inst of Elec Eng,
Acad Sci Ukrainian SSR

"Zhur Tekh Fiz" Vol XXII, No 6, pp 1004-1007

Analyzes passage of a certain wave type E₀₁ through
a sym diaphragm in a cylindrically shaped wave-
guide. A qual analysis was given by G. V. Kisyn'ko
(cf. "Electrodynamics of Hollow Systems," 1949),
and the computations were performed by M. I. Kon-
torovich (cf. "Zhur Tekh Fiz" Vol XVII, No 3, 269, 1947)
Calculates the dependence of frequency equiv to cond
of diaphragm during excitation by E₀₁ wave. Indebted
to V. V. Umed'yan. Received 11 Feb 52. 219T17

USSR/Electronics - Waveguides

FD-536

Card 1/1 : Pub. 90-12/13
Author : Rapoport, G. N.
Title : Some results in the general theory of waveguides with diaphragms
Periodical : Radiotekhnika 9, 78-80, May/Jun 1954
Abstract : States theory of waveguides with either one-time or periodically loaded diaphragms (excepting the case of small holes) is inadequately developed. Treats equivalent conductivity of diaphragms, field distribution and dispersion of standard waves, and equivalent circuits of waveguides with diaphragms. Five references: 4 USSR 1 USA.
Institution :
Submitted : May 10, 1952

USSR/ Electronics - Filters' characteristics

FD-1045

Card 1/1 : Pub. 153 - 16/23

Author : Rapoport, G. N.

Title : Correspondence between the energy and phase characteristics of electric filters

Periodical : Zhur. tekhn. fiz., 24, 1496-1498, Aug 1954

Abstract : Considers how to extend the theorem of Academician M. A. Leontovich (i.e. on the equality of the energy velocity and group velocity in non-dissipative media) to linear waveguide systems with periodic structure, for example, endovibrators or 2N-pole circuits. Applies Leontovich's theorem to filters to calculate the energy velocity from the data on the experimental investigation of dissipation. Thanks: S. D. Tetel'baum, Corr.-Mem. of Acad. Sci. Ukr. SSR. One reference, L. I. Mandel'shtam, Collected Works. 1950

Institution : --

Submitted : 18 March 1954

TETEL'BAUM, S.I.; GLADYSHEV, G.I.; RAPOPORT, G.N.

Methods of measuring the intensity of electric fields in resonators
and wave guides at superhigh frequencies. Sbor.trud. Inst.elektro-
tekhn. AN URSR no.12:108-114 '55. (MLRA 9:11)

(Electric fields--Measurement)

(Electric resonators)

(Wave guides)

USSR/Radiophysics - Superhigh Frequencies, I-11

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 35429

Author: Tetel'baum, S. I., Rapoport, G. N.

Institution: None

Title: Classification of Dispersion Characteristics of Nondissipative
Waveguides with Periodic Structure

Original
Periodical: Dopovidi AN URSR, 1956, No 2, 134-136; Ukrainian; Russian resumé

Abstract: It is proposed to determine the sign of the phase velocity relative
to the group velocity, which is always assumed positive. The terms
"normal" and "anomalous" dispersion are given in accordance with the
sign of the derivative of phase velocity with respect to the wave-
length. General ideas concerning the classification of the proper-
ties of dispersion structures are then further stated.

Card 1/1

Rapoport, G.N.

AUTHOR: RAPORT, G.N., Regular Member of the Society for Radio- PA - 2296
technology.

TITLE: The Measuring of the Current of the Electric Field in Endovibrators by
the Method of the Shifting of Resonance Frequency by Means of a Di-
electric Probe. (Izmereniye napryazhennosti elektricheskogo polya v
endovibratorakh metodom smeshcheniya rezonansnoy chastoty dielek-
tricheskim zondom. Russian)

PERIODICAL: Radiotekhnika, 1957, Vol 12, Nr 2, pp 51-58 (U.S.S.R.)
Received: 4 / 1957 Reviewed: 4 / 1957

ABSTRACT: A resonator which is limited by an ideally conductive casing S_0 is in-
vestigated. Ideal nonconductors I and II are assumed which are separated
by a surface S . The theorem of the separating boundary between the two
nonconductors in a space resonator is derived, and an approximated
formula for the relative shift of resonance frequency in the case of a
deformation of the separating boundary of two nonconductors in the endo-
vibrator is obtained. For the case of a spherical probe with a suffi-
ciently small radius a the fluctuating field E_0 may be considered to be
uniform and quasisteady within the domain in which the probe is applied.
The full relative shift of frequency is obtained. In the case of
 $\epsilon = \infty$ the last-mentioned equation applies to the theory in a con-
ductive probe only if the probe is located in the node of the magnetic
field. A probe having the shape of an elongated rotation ellipsoid
makes it possible to determine the direction of the field E_0 . The

Card 1/2

Pa - 2296

The Measuring of the Current of the Electric Field in Endo-vibrators by the Method of the Shifting of Resonance Frequency by Means of a Dielectric Probe.

frequency shift will be greatest if the spheroid axis takes its course along the lines of force. The formula for such a case is derived. Next, long needle-shaped probes are investigated. The possibility of using such probes is demonstrated and it is found that they are very effective for measuring the voltages of a longitudinal field on the axis of the "wave-carrying" resonators with cylindrical symmetry. The measuring method for slight shifts of resonance frequency and measuring of connecting resistances is discussed. The nonconductive probe offers the advantage that it reacts only to the electric and not also to the magnetic field. (1 illustration)

ASSOCIATION: Not given

PRESENTED BY:

SUBMITTED: 24.2.1956

AVAILABLE: Library of Congress

Card 2/2

57-9-25/40

AUTHOR: Rapoport, G.N.
TITLE: On the Problem of the Propagation of Waves in the Electric Circuit of Cylindrical Resonators
(K voprosu o rasprostranenii voln v tsepochke tsilindricheskikh rezonatorov)
PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol. 27, Nr 9, pp.2105 - 2108 (USSR)
ABSTRACT: Two varieties of an equivalent scheme for the electric circuit of the resonator are investigated. Qualitatively the influence exercised by the resonance of connecting elements is discussed. A cylindrical wave guide, which is divided into equal parts having a length of L by infinitely thin transverse walls diaphragm S with s openings, is investigated. The conductivity of the walls is assumed to be perfect. It is shown that a section of the linear resonator circuit can be compared with an equivalent Γ -shaped blind (reactive) fourpole. The parameters of the latter are determined by the here derived equations in consideration of the dependence of γ_n (propagation parameter of the wave of nth order) and Y (wave conductivity for this wave) for E- and H waves upon frequency. It is shown that to each eigenfrequency of the cylindrical resonator there corresponds a trans-

Card 1/2

20-3-15/52

AUTHOR:

Rapoport, G. N.

TITLE:

Some Results of the Nonlinear Theory of Self-Oscillations of a Tube With an Inverse Wave With Longitudinal Field (Nekotoryye resul'taty nelineynoy teorii avtokolebaniy lamy obratnoy volny s prodol'nym polem)

PERIODICAL:

Doklady AN SSSR, 1957, Vol. 117, Nr 3, pp. 411 - 414 (USSR)

ABSTRACT:

The present paper investigates a simplified model of a tube with inverse wave in which the electron bundle is considered to be the discrete sequence of charged disks located at equal distances from one another. The parameter of the space charge QC is considered to be small. Therefore only the first harmonic of the longitudinal Coulomb field is investigated. The most general conditions and the method used for the derivation of the equation are here the same as in three previous works dealing with the same subject. (references 4, 5, 6). The motion of each electron is characterized by the phase of the undisturbed wave $z = \gamma s - \omega t = z(\alpha, x)$ in the point of localization of the electron s. The electrons are distinguished by the moments t_0 of the input into the system or by the initial phases $\omega t_0 = \alpha_0$. The dimensionless coordinate $x = 0(\omega/v)s$ is considered to be an independent variable. Here

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20-3-15/52

Some Results of the Nonlinear Theory of Self-Oscillations of a Tube With an Inverse Wave With Longitudinal Field

denotes the frequency, v - the velocity of the electrons, $C = 2,9 \cdot 10^{-3} (I \lambda^2 R_{\text{coupling}})$, λ - the wavelength, R_{coupling} - the resistance of the coupling of the system. For the excitation of the vortex field of the system a formula is given. The mode of operation of the tube is determined uniquely by the initial conditions at the input of the electrons into the delayed system. The corresponding system of equations and initial conditions was solved for various values of the parameter b (parameter of the increase of velocity). The dependence of the efficiency-coefficient on the reduced length of the system is illustrated by means of a diagram. From this and several other diagrams it may be seen that, in the case of operation with low voltage and in the case of trigger operation, the amplitude of the field decrease monotonously in the direction from the energy lead-off to the collector. By an increase of amperage within the bounds of an operation with low-voltage, the optimum grouping of electrons is obtained not at the end but in the middle of the range. In the case of operation excessive voltage, field distribution has a minimum, which is shifted with an increase of amperage from the collector towards the energy output. In this case the tube with inverse wave is, more or less, subdivided into

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20-3-15/52

Some Results of the Nonlinear Theory of Self-Oscillations of a Tube With an Inverse Wave With Longitudinal Field

two parts which operate with counter-phase. In conclusion, the increase of the useful coefficient is discussed. There are 4 figures, and 6 references, 1 of which is Slavic.

ASSOCIATION: Institute for Electric Engineering AN Ukrainian SSR
(Institut elektrotekhniki Akademii nauk USSR)

PRESENTED: June 10, 1957, by N. N. Bogolyubov, Academician

SUBMITTED: June 10, 1957

AVAILABLE: Library of Congress

Card 3/3

Rapoport, G.N.

The traveling-wave tube as oscillator. Izv. vys. ucheb. zav.; radio-
tekhn. no.2:202-208 Mr-Ap '58. (MIRA 11:5)

1. Rekomendovane kafedroy radioperedayushchikh ustroystv Kiyevskogo
ordena Lenina politekhnicheskogo instituta.
(Traveling-wave tubes)

SOV/142-58-5-13/23

9(3)

AUTHOR: Rapoport, G.N.

TITLE: The Non-Linear Theory of the Traveling Wave Tube (a survey)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy - radiotekhnika, 1958, Nr 5,
pp 599-615 (USSR)

ABSTRACT: The author gives a survey of the Traveling Wave Tubes non-linear theory. This theory also allows estimation of phase distortion in the traveling wave amplifier. The survey gives methods and primary results of the traveling wave tube theory with longitudinal interaction. It is compiled from literature on this subject. The author refers to following authors: Nordsieck, Savel'yev, Slater, Vlasov, A.A., Brillouin, L., Poisson, Pears and Tetel'baum. The article is recommended by the Institut elektrotehniki AN USSR (Institute of electrical Engineering of the AS UkrSSR). There are 6 graphs, 1 schedule, 39 equations and 45 references, 25 of which are Soviet, 17 English and 3 French.

Card 1/1

SUBMITTED: April 10, 1958

AUTHOR: Rapoport, G.N.

109-3-2-12/26

TITLE: Preliminary Results of the Nonlinear Theory of Oscillation
of a Backward-wave Tube with a Longitudinal Field (Preivari-
tel'nyye rezul'taty nelineynoy teorii avtokolebaniy lampy
obratnoy volny s prodol'nym polem)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol.III, No.2
pp. 249 - 254 (USSR).

ABSTRACT: It is pointed out that the existing linear theory (Refs.
1 and 2) of the backward-wave oscillator is inadequate for the
evaluation of its efficiency. An attempt is made, therefore, to
describe the system by means of a simplified non-linear theory.
In the analysis, it is assumed that the attenuation in the slow-
wave system and the Coulomb forces in the electron charges can
be neglected. It is also assumed that the system is terminated
with a matched load and that its gain is comparatively low. It
is shown that the phase of the electron motion in the tube can
be described by Eq.(2), where the electron path s is regarded
as an independent variable. The individual electrons differ
by their initial phase $\alpha = \omega t_0$. The amplitude of the first
current harmonic and the fundamental of the longitudinal field
can be expressed by two slowly changing functions $f(x)$ and

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109-3-2-12/26

Preliminary Results of the Nonlinear Theory of Oscillation of a Backward-wave Tube with a Longitudinal Field

$F(x)$, so that the current and the field are expressed by:

$$\begin{aligned} J_1 &= -Ie^{-i\gamma s} f(x), \\ E &= Ke^{-i\gamma s} F(x) \end{aligned} \quad (4)$$

where K is a coefficient chosen in such a manner that the energy flow in the field is given by:

$$P = CIV \frac{|F|^2}{2} \quad (5).$$

The parameter x is expressed by Eq.(3), in which ω is the frequency, v is the electron velocity, $C = 2.9 \cdot 10^{-3} (I\lambda^2 R)^{1/3}$, λ is the wavelength and R is the coupling resistance of the system. From the above equations, it is shown that the electron motion can be described by Eq.(8). The operation of the tube can be determined from the boundary conditions expressed by Eq.(9), where b is a velocity ratio and ϵ is the amplitude of the longitudinal

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109-3-2-12/26

Preliminary Results of the Nonlinear Theory of Oscillation of a Backward-wave Tube with a Longitudinal Field

field at $x = 0$. Solution of the system for the above boundary conditions permits the determination of the field at any point of the tube. However, in general, such a solution does not describe the oscillatory conditions in the system, since, in this case, the field at the "collector" end of the slow-wave system should be zero, i.e: $F(N) = 0$ (10),

where

$$N = C \frac{\omega}{v} L$$

and L is the length of the system. If it is assumed that the real of the imaginary components of the field amplitude is dependent on ϵ and b , the condition imposed by Eq.(10) is realisable only at certain particular values of ϵ and b which can be found from the system of equations represented by Formulae (11). If such values of ϵ and b are found and are expressed as:

$$\epsilon = \Phi_1(N); \quad b = \Phi_2(N),$$

the output power is given by Eq.(12) and the electron efficiency of the tube is expressed by Eq.(13). The above theory was employed to evaluate the performance of a backward.

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109-3-2-12/26
Preliminary Results of the Nonlinear Theory of Oscillation of a
Backward-wave Tube with a Longitudinal Field

wave oscillator. The results are shown in Figs. 1, 2, 3 and 4. Fig. 1 shows the dependence of the normalised efficiency of the tube as a function of a parameter I/I_{Π} , where I_{Π} is the trigger current of the system. Fig. 2 shows the output power as a function of I/I_{Π} , while the curves of Fig. 3 represent the amplitude of the field and the fundamental of the beam current as a function of x . Fig. 4 shows phase-amplitude diagrams of the system for two different regimes. From the above calculated data, it is concluded that by increasing the space charge parameter from 0 to 1.5, the maximum efficiency of the system is increased by 17%. On the other hand, a wave-guide attenuation of 2.6 db reduces the maximum efficiency by 28%. There are 4 figures and 6 references, 5 of which are English and 1 Russian.

SUBMITTED: March 13, 1957

AVAILABLE: Library of Congress
Card 4/4

1. Radio engineering-Theory 2. Mathematical analysis

AUTHOR: Rapoport, G.H.

109-3-2-13/26

TITLE: Increase of the Efficiency of a Backward-wave Oscillator ("Carcinotron-O") due to an Increase in the Volume Charge Parameter (O mekhanizme vozrastaniya kpd generatora obratnoy volny ("karsinotrona-O") pri uvelichenii parametra ob'yemnogo zaryada)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol.III, No.2, pp. 255-261 (USSR).

ABSTRACT: The increase in the power efficiency of backward-wave tubes as a function of the volume charge parameter, QC, has been observed by various authors (Ref.1-5). From the data available, it is to be expected that the efficiency as a function of QC should have a maximum, but this effect has not been investigated so far. For the study of the efficiency, a special tube is considered. The device (see Fig.1) consists of: 1) a cathode, 2) an accelerating electrode, 3) a collector, 4) an electron beam, 5) a slow-down system having a low coupling resistance, 6) a section having an increased coupling resistance, 7) a phasing section, 8) a power output device and 9) a matched load. The slow-down system of the tube is composed of a long section having a low coupling resistance RCB and of a short section having a large coupling

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100-3-2-13/26

Increase of the Efficiency of a Backward-wave
Oscillator ("Carcinotron-O") due to an Increase in the Volume Charge
Parameter

resistance R' such that:

$$R' = n^2 R_{CB} \quad (1)$$

where $n \gg 1$, and:

$$\ell/L = \sqrt{\ll 1} \quad (2)$$

where:

$$\sqrt{n} \gg 1 \quad (3).$$

The problem consists of determining the maximum efficiency
of the tube at various values of the space charge parameter.
In every case, it is necessary to find optimum values of the
lengths L and ℓ but to keep their ratio constant and
equal to $\sqrt{ }$. It is shown that the amplitude of the first
harmonic of the beam current i_1 at a distance s from the
Cari 2/4

102-3-2-13/26

Increase in the Efficiency of a Backward-wave
Oscillator ("Carcinotron-0) due to an Increase in the Volume Charge
Parameter

centre of the buncher can be written as Eq.(4), where the bunching coefficient is expressed by Eq.(5) in which I is the beam current, J_1 is the Bessel function of the first order, $\gamma_e = \omega/v$, ω is the frequency of the oscillation, v is velocity of the electrons, E' is the field intensity in the buncher and V_o is the accelerating voltage. The longitudinal de-bunching in the system can be taken into account if Eq.(5) is multiplied by an additional factor expressed by Eq.(6), where h is given by Eq.(7) and ω_p is the effective plasma frequency of the beam. For the oscillations of the lowest order, the phase balance in the system can be expressed by:

$$u = v \quad (8).$$

The amplitude balance can be expressed by:

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$$E' = \frac{IR}{n} \int_0^L J_1(r) ds \quad (9).$$

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Increase of the Efficiency of a Backward-wave Oscillator
 ("Carcinotron-0") due to an Increase in the Volume Charge
 Parameter

If T is defined by Eq.(10) or by Eq.(11), where C is a gain parameter, and if new variables, defined by Eqs.(12) and (13) are introduced, the amplitude balance can be expressed by Eq.(16). By correcting this equation by a factor expressed by Eq.(6), the final amplitude balance can be defined by: x

$$A_0 = 2 \int_0^{\infty} J_1 \left(A_0 \frac{x}{\mu} \sin \mu y \right) dy \quad (17)$$

where:

$$\mu = \frac{\omega_p}{Tw} = \frac{1}{(n\sqrt{V})^{1/3}} \sqrt{4QC} \quad (18)$$

and μ^2 is the effective space charge parameter. Eq.(17) is used to evaluate the performance of the tube. This is done by assuming that the Bessel function J_1 can be expressed

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109-3-2-17/26

Increase of the Efficiency of a Backward-wave Oscillator
("Carcinotron-0") due to an Increase in the Volume Charge
Parameter

approximately by Eq.(24). The calculated results are shown in Figs. 2, 3, 4 and 5. The curves of Fig. 2 represent the amplitude of the first current harmonic as a function of the bunching coefficient, r . The curves of Fig. 3 represent the electron efficiency as a function of x ; the curves are constructed for the following values of μ : I) $\mu = 0$, II) $\mu = 0.473$, III) $\mu = 0.946$, IV) $\mu = 1.419$, V) $\mu = 1.585$. Since the maximum efficiency can be expressed by:

$$\eta_{\max} = \frac{C}{(nv)^{2/3}} f(\mu) \quad (28),$$

it is of interest to evaluate the function $f(\mu)$; a graph of $f(\mu)$ is shown in Fig. 4. Graphs of the field amplitude distribution and of the current are shown in Fig. 5; Curve I refers to $\mu = 0$, Curve III is for $\mu = 0.946$, Curve IV is for $\mu = 1.419$ and Curve V is for $\mu = 1.585$. It is pointed out that the above analysis is valid provided each of the two sections of the system has a wide margin of stability.

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Increase of the Efficiency of a Backward-wave
Oscillator ("Carcinotron-O") due to an Increase in the Volume
Charge Parameter

(i.e. there is no tendency to oscillate) and the field in the section having a low coupling resistance does not affect the motion of the electrons.

There are 5 figures and 11 references, 6 of which are English, 5 Russian. 3 of the Russian references are translated from English.

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Card 6/6 1. Radio engineering-Theory 2. Mathematical analysis

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